

High Volume Chemical Water Column Monitoring Sampling Program Characterization
Summary for the Lower Passaic River Study Area
Dated February 2014
Response to EPA Comments
Response to 6/18/14 EPA Comments

No.	Section/ Worksheet No.	Comment	
1	General	Please note that throughout the document a bold line appears at random at various parts of the pages. For example, on page 1-1 following the second paragraph, and page 3-3 in the center of the last paragraph. It appears that this symbol coincides with the indicated footnote number.	This formatting error will be fixed in the next version of the Report.
2	General	The Newark Bay Study Area (NBSA) samples are discussed in the High Volume Chemical Water Column Monitoring (HV CWCM) Report; however, the NBSA data are excluded from some figures (particularly Figures 3-4 and 3-5). We expect that NBSA HV CWCM data evaluation will be completed by Tierra Solutions, Inc. (Tierra) to satisfy the Data Quality Objectives (DQOS; as stated in Section 1.2, page 1-6).	Agreed. Tierra Solutions, Inc. should provide a detailed report on the data collected in the NBSA. The report provided by the CPG provides analysis of LPRSA data only. Language will be added to the Report that specifically indicates LPRSA data are examined and that NBSA data will be examined and the technical report will be provided by Tierra.
3	General	There is a brief discussion in Section 3.3.1 which notes any discernible trends of 2,3,7,8-TCDD and PCBs relative to salinity. It would be beneficial to include an additional section and supporting figures in the document which discusses any trends in the data relative to POC/DOC and SSC and how they compare to those observed during the SV CWCM event.	The relationship of SSC, POC and DOC to chemical concentrations reflects directly on the development of the partition coefficients. To provide clarity to these relationships, this will be addressed in the Remedial Investigation (RI) Report. No changes to the HV CWCM Report are necessary.
4	General	References to HV QAPP revisions noted in the References section of the document indicate there were three revisions, Revision 2 (AECOM 2012a) and Revision 3 (AECOM 2012b). Citations made in the document indicate otherwise. For example, on page 2-3 at the bottom of the page the citation AECOM 2012a is used to reference Revision 0, and on page 2-4 in the sentence that follows the bullets the same citation is used to reference Revision 1. Please revise citations and references as appropriate.	The Report will be modified to clarify the revision sequence of the HV QAPP.

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5	General	<p>The HV CWCM database includes both the laboratory data and the CPG unit-converted values. For the database rows calculated by the CPG, the CPG provided a calculated detection limit when the laboratory reported nondetected target compounds. This detection limit was calculated by dividing the laboratory reporting limit (RL) by the volume of filtered water. However, the database indicates that the RL is equivalent to the Method Detection Limit (MDL). It should be noted that organic contaminants (such as PCB and PCDD/F) are reported as detected concentrations down to the Quantitation Limit (QL; or the lowest point on the calibration curve); they are then estimated from the QL to the sample-specific detection limit. Please confirm that the sample-specific detection limit equals the RL in the database. (Currently, the RL column equals the MDL column so it is unclear if the RL represents the sample-specific detection limit or the statistical MDL value). Please also discuss the difference in calculating the nondetected dissolved-phase concentration if it was equal to the QL or half the QL, as opposed to reporting the nondetected concentrations to the RL/equivalent MDL.</p>	<p>The RL in the database will be reviewed and confirmed. Per the HV CWCM QAPP, the RDL for PCDD/F and PCBs is equal to the Estimated Detection Limit (EDL).</p> <p>A section will be added to the Report that describes, in detail, the treatment of non-detects, including in the converted value calculations.</p>
6	General	<p>The partition coefficient calculations presented in Appendix F are inconsistent with the three-phase partitioning used in the contaminant fate and transport model and should be revised to generate partition coefficients consistent with the model input. It is noted that EPA's comments on the HV CWCM QAPP included the following comment on Worksheet 10:</p> <ul style="list-style-type: none"> a. When discussing the calculation of partitioning coefficients, the QAPP should state that the coefficients to be developed will be site-specific and that the operationally-defined dissolved-phase concentration is expected to include contaminants bound to colloids, to the extent that this fraction is captured by the sorption medium (PUF). <p>Note that the AECOM memo dated May 4, 2012 on the AP and Gravity Environmental studies performed with the PR-2900 and colloidal spikes showed that the PUF media and filters did not show good recovery for colloidal particulates of 0.1 um. If colloids (and</p>	<p>Appendix F will be excluded from the HV CWCM Report. The modeling team will provide a detailed description of the derivation of the partition coefficients in a technical memorandum. Rather than providing an addendum to the HV CWCM Report, the CPG proposes to append this memorandum to the RI Report.</p>

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		<p>their associated contaminant load) are not being captured by the PUF, then how will the partitioning coefficients be impacted (i.e., contaminant mass passing through and not being accounted for in either the particulate-phase or dissolved-phase)?</p> <p>b. Summarize how partition coefficients will be developed for each separate analyte (if so) and how the partition coefficients will be used to support the CFT model.</p> <p>c. Describe how the SSC, DOC and POC data will be used in the partition coefficient calculations and how this will support improvements to the CFT model.</p> <p>To which the CPG responded: “(a), (b) and (c) Development and calculation of partition coefficients is beyond the scope of this QAPP. The CPG Modeling Team will develop a Technical Memorandum for USEPA review that describes the partition coefficient development. The methods for development will be finalized upon initial review of the HV data. The QAPP will be revised to cite preparation of the Technical Memorandum.” The CPG Modeling team is directed to develop and submit the technical memorandum discussed in the response to QAPP comments. Appendix F should be deleted and submitted as an addendum after EPA’s review and comment on the CPG’s technical memorandum on partitioning.</p>	
7	Page ES-2, Introductory paragraph to second set of bullets, Second sentence	The text refers the reader to Section 3.4 of the document; however, there is no Section 3.4. Please revise as appropriate.	This typographical error will be corrected in the revised Report.
8	Page 1-2, First paragraph, Second sentence	The text notes that the SV CWCM work was completed in July 2013. The date is incorrect the SV CWCM work was completed in June 2013. Please revise.	This typographical error will be corrected in the revised Report.

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9	Page 1-3, First paragraph of Section 1.1.1, Last sentence	There is an extra period at the end of the sentence.	This typographical error will be corrected in the revised Report.
10	Page 1-7, First paragraph, Second sentence	Please include NB East as noted on the referenced figure (Figure 1-2) and in Section 2.2.5.	This section was intended to indicate the design of the program as described in the HV QAPP. NB East was sampled, despite not being in the QAPP (as described in the Report). This section will be clarified.
11	Page 1-7, First paragraph	The HV CWCM Report states that two sampling locations in Newark Bay were sampled: NB South and NB Northeast; however, Figure 1-2 shows three locations sampled: NB South, NB Northeast, and NB East. To be consistent with text in Section 2.2.5, Page 2-5, please state in Section 1.3 that during the first event, NB East was inadvertently sampled instead of NB Northeast. NB Northeast was sampled during the second HV event. A similar note should be added to Figure 1-2.	This section was intended to indicate the design of the program as described in the HV QAPP. NB East was sampled, despite not being in the QAPP (as described in the Report). This section will be clarified. A note will be added to Figure 1-2.
12	Page 2-2, First paragraph, Fourth sentence	The HV CWCM Report states "As the water flows through the system, the solids are separated to a nominal size (0.7 μ m) using a vortex separator followed by a flat glass fiber filter." Please correct the sentence to reflect that surface water passed through the pre-filter and the glass fiber filter before entering the PR2900 vortex. More importantly, solids less than a nominal size 0.7 μ m likely passed through the filters, and then the vortex further removed particles (less than a nominal size of 0.7 μ m) from the flow stream.	The sentence is correct. The water passed through the vortex separator then passed through the 0.7 μ m flat filter. The glass wool pre-filter is mentioned in the following sentence. As outlined in the HV CWCM QAPP, the dissolved phase of the water was defined operationally as < 0.7 μ m; particles smaller that may have passed through the filtration series were considered part of dissolved phase. No changes to the Report are necessary.

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13	Page 2-8, Section 2.4.1.2	According to the HV CWCM QAPP, field data were originally planned to be modified for the dynamic spike and static spike. Please state in the HV CWCM Report that a Field Modification was issued to report field data as provided by the laboratory with only a unit conversion for the average suspended solids concentrations.	<p>The HV CWCM QAPP (Worksheet #28 and Appendix A) specifically states that the dynamic spike and static spike were provided for informational use only. Worksheet #37 says "Results will not be recovery corrected for dynamic or static spike recoveries."</p> <p>No Field Modification was submitted to provide instruction for the conversion of units. The calculations described in the comment were provided in Worksheet #37 of the HV CWCM QAPP.</p> <p>No changes to the Report are necessary.</p>
14	Page 2-8, Section 2.4.2, First sentence	Please revise company name to read: The Louis Berger Group, Inc.	This typographical error will be corrected in the revised Report.
15	Page 2-9, Section 2.4.3, First paragraph, Third sentence	The HV CWCM Report states that "In general, the USEPA Region 2 validation SOPs were used as the basis for validation. If a Region 2 SOP was not available for a specific method, an SOP for a similar method was adopted for guidance." Please clarify which validation SOPs were used for PCB and PCDD/F validation, since USEPA Region 2 guidance is available for these parameters.	This sentence will be clarified. Validation of PCDD/F and PCB were conducted consistent with Region 2 guidance, with minor modifications provided in Appendix A.
The	Page 2-9, Section 2.4.3, Second paragraph, First sentence	Remove the words "at a minimum" since 100 percent validation was conducted.	This typographical error will be corrected in the revised Report.
17	Page 2-12, Table 2-2	Please change table header to read "Average Salinity" to be consistent with Footnote A, and round values to two significant figures.	This typographical error will be corrected in the revised Report.

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18	Page 3-1, Section 3.0	<ul style="list-style-type: none"> a. Please include a discussion on the results of the dynamic spike and static spike, including an evaluation of whether the PUF media performed as expected. b. Please include a table with the percentage of total dissolved contaminant mass detected in the first PUF and second PUF. Please discuss whether analysis of the second PUF detected target compounds, and whether two PUFs would continue to be needed in future sampling events. c. Please expand the discussion of the results of the post-PUF filtrate analysis. The brief discussion in Section 4.3.2 does not provide enough information. 	<ul style="list-style-type: none"> a. A section will be added to the Report that discusses the results of the static and dynamic spikes as well as the performance of the PUF. b. A table will be added providing the percentages of dissolved mass detected on first and second PUFs. Based on the results of this analysis, the revised Report will include a statement regarding the necessity and use of the second PUF. c. The results of the post-PUF filtrate samples will be expanded.
19	Page 3-1, Section 3.2	Please state how nondetected values were incorporated into the Total PCB concentrations and whether Total PCB represents a laboratory-calculated value or an independent summation of validated PCB congener data.	See response to Comment #5.
20	Page 3-1, Section 3.3.1 and Figures 3-1 and 3-2	Solubility depends on salinity and temperature. Please distinctly identify the winter and summer samples on Figures 3-1 and 3-2 by using different colors or different shapes.	Figures 3-1 and 3-2 will be color coded for winter and summer sampling.
21	Page 3-1, Section 3.3.1, Second bullet	The text notes that two samples collected above Dundee Dam had higher levels of 2,3,7,8-TCDD than other samples. However, this information is not depicted on the referenced figures (3-1 and 3-2), which the last sentence of the introductory paragraph indicates "Figures 3-1 and 3-2 present... and support the following observations."	Figure 3-1 is the dissolved TCDD as a function of salinity. The station above Dundee Dam has the lowest salinity, and has highest TCDD concentrations. Figure 3-1 supports the statement. Additional reference will be made to Tables 3-1 and 3-2, which provide the actual concentrations of 2,3,7,8-TCDD in the samples.

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22	Page 3-2, Section 3.3.2, and Figures 3-4 and 3-5	<p>a. Please clarify if data presented in Figures 3-4 and Figure 3-5 represent dissolved, suspended solids, or total concentrations. Calculated total concentrations presented in Table 3-2 should be compared to the Small Volume (SV) program for consistency in sample type.</p> <p>b. The HV CWCM Report concludes that the contaminant concentrations in the HV samples are within the range of those concentrations reported in the SV program in the Lower Passaic River. Please include the Newark Bay samples on Figures 3-4 and 3-5 since the 2,3,7,8 TCDD concentration is greater in the Lower Passaic River than Newark Bay.</p>	<p>a. The data presented in Figures 3-4 and 3-5 are calculated total water column concentrations, which are also presented in Table 3-2. The comparison to SV CWCM concentrations is presented in the figures. A note will be made to indicate this on Table 3-2 and Figures 3-4 and 3-5.</p> <p>b. As indicated by EPA in Comment #2, Tierra will provide EPA with a report that provides discussion and interpretation of the NBSA data. No edits will be made to the Report.</p>
23	Page 3-2, Section 3.3.3 and Table 3-2	The field duplicates presented in Table 3-2 showed a relative percent difference (RPD) greater than 50% for 2,3,7,8 TCDD at the Lower Passaic River station but less than 40% in Newark Bay. Please review field notes to confirm that field co-locates were collected in a similar manner at the two stations. It is also recommended that a footnote be added to Table 3-2 stating that samples marked "DUP" are actually co-located samplers. (A cross reference to Section 4.3.1 may also be useful to describe the co-located samples.)	The field data will be reviewed to confirm that the collection procedures for the co-located samples at the two stations were similar. A footnote will be added to Table 3-2 per the comment to indicate that the field duplicate samples were collected as co-located samples per the QAPP and as described in Section 4.3.1.
24	Page 3-2, Section 3.3.3 and Table 3-2	Section 3.3.3 provides a mathematical equation for calculating the total whole water concentration, which is presented in Table 3-2. Please provide a cross-reference to a table or database column where the "Sample Volume" (or total volume of water that passed the PR2900) is listed.	A cross-reference will be added to the Report.
25	Page 3-3, Section 3.3.4 and Table 3-3	The HV CWCM Report shows that the HV samples provided lower detection limits and fewer nondetect results compared to the SV samples. Please provide a comparison of the 2,3,7,8 TCDD and Total PCB concentrations in HV samples relative to the nondetect SV samples.	The range of non-detects from SV CWCM will be provided and compared graphically to the concentrations of 2,3,7,8-TCDD and Total PCBs.

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26	Page 3-3, Section 3.3.5, First paragraph	In accordance with the QAPP, the CPG calculated the site-specific partition coefficient (i.e., K_d = particulate-phase concentration / dissolved-phase concentration). Section 3.3.5 states that a detailed analysis of the partition coefficient would be provided in a future RI deliverable. It would be beneficial to discuss the impacts of organic carbon on the K_d value and its application to the model.	The modeling team will provide a detailed description of the derivation of the partition coefficients a technical memorandum which will be provided as an attachment to the RI Report. This deliverable will consider the impacts of organic carbon on K_d . No edits to the Report are necessary.
27	Page 3-3, Section 3.3.5 and Appendix F	Please clarify if "Tetra-PCB" represents an individual PCB congener or a homologue group. Based on Appendix F, it may represent a homologue group with nondetects included in the summation as half the detection limit. Please confirm.	This will be clarified in the future partition coefficient deliverable. Appendix F will be excluded from the HV CWCM Report.
28	Page 3-3, Section 3.3.5 and Table 3-1	The sorption coefficient is dependent on the particulate phase concentration, which represents a converted value from the average suspended solids concentration. Please review the suspended solids concentration data for Newark Bay N10-CE05-TNNE; according to Table 3-1, the suspended solids concentration had a high standard deviation: 16.9 +/- 10.43 mg/L. Please confirm that an outlier datum is not skewing the average concentration.	The suspended solids data from N10-CE05-TNNE will be examined. Potential impacts to the sorption coefficient will be provided in the future deliverable (refer to Comment #6).
29	Page 3-5, Bottom of Table 3-1	The footnote on Table 3-1 states "During the first HV event, results of HOCs in PUF2 exceeded PUF1 in some locations. While no evidence of mis-labeling occurred, the field team photographed the labeling during the second HV event to confirm PUF1 and PUF2." Please discuss this apparent nonconformance in the main text and explain that the dynamic spike surrogates (added to the PUF cartridges in the field) were greater in PUF2 than PUF1, which provides a strong indication that the cartridges were inadvertently exchanged/mislabeled in the field. Please clearly mark the impacted samples in Table 3-1 and add a note to the database. Impacted samples include: 12I-CE05-T175-AM01/02 12I-CE05-TTR2-BM01/02 (T042) 12I-CE05-TTR2-BN01/02 (T042) N08-CE05-TNBS-BM01/02	The tracing of the dynamic spike and the apparent nonconformance will be clarified in the text and Tables. A note will be added to the database where PUF2 dynamic spike concentrations exceed those in PUF1.

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30	Page 3-6, Table 3-2	Please round calculated concentrations to two significant figures.	The Report will be revised.
31	Page 3-6 (Table 3-2) and Page 3-8 (Table 3-4)	There is an apparent discrepancy between Table 3-2 and Table 3-4 regarding incorporation of nondetect dissolved-phase concentrations into the HV CWCM data presentation. For Table 3-4, when both PUF1 and PUF2 had nondetect concentrations, the dissolved phase concentration was set equal to (PUF1 reporting limit + PUF2 reporting limit)/2. Table 3-2 (and the associated text in Section 3.3.3) does not clearly state how dissolved phase concentrations were calculated when both PUF cartridges were nondetect; however, based on the reviewer's calculations for Sample 12I-CE05-T175, it appears that the reporting limits from both PUF cartridges were added together. For consistency, please revise Table 3-2 to be consistent with Table 3-4 and state clearly how nondetect concentrations were incorporated. This discussion needs to include all iterations where a nondetect result is involved (i.e., where both results are nondetects and where one result is nondetect and the other is detect).	The calculations provided in Table 3-2 will be clarified, and concentrations re-calculated as necessary.
32	Page 4-1, Section 4.1, Last sentence	The HV CWCM Report states that "Region 2 data validation guidance does not provide a mechanism for assigning bias." Based on internal batch quality control samples, the validator should be able to assign a low or high bias to the data. Please clarify this statement.	Validation followed Region 2 guidance. As such, no bias codes were assigned. The text in the Report will be clarified.
33	Page 4-1, Section 4.2, First sentence	Please clarify why the post-PUF sample was not validated.	It was not the intent of the program to have the 10L samples validated. No QA samples were collected to support the validation. The data were used for informational purposes only. Inclusion of the data validation rules for the post-PUF filtrate samples in the HV QAPP was to provide guidance should the 10L samples become part of the full program (upon review of HV Event 1 data).

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34	Page 4-4, Section 4.3.6, First paragraph, Fifth sentence	The HV CWCM Report states that "reporting limits were elevated based on method or equipment blank concentrations." Please discuss which specific analytes were impacted by equipment blank contamination, and document if the equipment blank contamination observed during the May field demonstration was resolved or continued during the field program. Please reference data in Appendix G.	The concerns in the blank contamination from the May 2012 field demonstration were resolved. This will be discussed in the Report. Section 4 will be amended to better describe blank contamination in the actual samples collected during December 2012, January 213 and July 2013 for use in the RI/FS.
35	Appendices A and B	<p>In the Appendix A instructions to the data validators they were directed to narrate in the data validation memo instances where:</p> <ul style="list-style-type: none"> a. The concentrations of native compounds in the second PUF exceed the concentration in the first PUF. b. The labeled compounds (static and dynamic spikes) are recovered outside the recovery limits. <p>As identified in Specific Comment number 30 above there where instances were these situations would have been encountered. There is no discussion noted in the associated data validation reports for these or other occurrences of the instances listed above. Please update the data validation reports as needed to address these analytical anomalies.</p>	The Data Validation Reports will be reviewed and re-issued, as necessary. Any updated Data Validation Reports will be included in the next submittal of the Report.
36	Appendix F, Tables 1 and 2	<ul style="list-style-type: none"> a. Please add footnotes to better describe the table header columns, such as: suspended solids results are an average concentration, particulate and dissolved concentrations had a unit conversion, etc. b. Similar to Table 3-1, please include the standard deviation information on the suspended solids average concentrations. c. The tables in Appendix F appear incomplete (compared to Table 3-1) and are missing data from the second HV sampling event. d. Please correct the location IDs in Appendix F (currently the same location ID is listed for both Round 1 and Round 2). 	Appendix F will be removed from the HV CWCM Report. See response to Comment #6. EPA's comments will be addressed in the technical memorandum to be provided as an attachment to the RI Report.

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37	Appendix F, Tables 1 and 2	<p>Appendix F provides details on the calculation of the partitioning coefficients. Table 1 in Appendix F includes the dissolved contaminant mass in PUF1 and PUF2, whereas Table 2 only examines the contaminant mass in PUF1 (and assumes that the mass in PUF2 is colloidal-bound and not associated with the truly-dissolved phase). Based on the footnote on Table 3-1, four PUF samples may have been inadvertently exchanged in the field. Based on examination of Sample 12I-CE05-T175 (first row in Table 2), it does not appear that the CPG corrected the PUF1 and PUF2 sample IDs. The dissolved phase concentration for 2378-TCDD is 0.0010 pg/L, which is half of the reporting limit for PUF1 (0.00204 pg/L) listed in the database (which is really PUF2). Please correct Appendix F and Table 3-4 accordingly to account for this nonconformance.</p>	<p>The derivation of the partition coefficients will be described in a separate submittal. See response to Comments #6 and #29.</p>